

REMARKS


The above amendment is believed to correct typographical errors in the specification and to place the claims in proper condition for examination. Early and favorable action is awaited.

Attached hereto is a marked-up version of the changes made to the specification and claims by the current amendment. The attached page is captioned "Version with markings to show changes made."

In the event there are any additional fees required, please charge our Deposit Account No. 01-2340.

Respectfully submitted,

ARMSTRONG, WESTERMAN & HATTORI, LLP


Stephen G. Adrian
Reg. No. 32,878

Atty. Docket No. 011731
Suite 1000
1725 K Street, N.W.
Washington, D.C. 20006
Tel: (202) 659-2930
SGA/yap

VERSION WITH MARKINGS TO SHOW CHANGES MADE

The paragraph beginning at page 18, line 5, has been amended as follows:

(3) an alicyclic or aromatic adjacent dicarboxylic acid di(higher alkyl)ester represented by the formula (8)



wherein A, X and R^{6a} are as defined in the formula (4a), and the two ~~-COOR⁶~~-COOR^{6a} groups are the same and attached to two adjacent carbon atoms of the cyclohexane, cyclohexene or benzene ring represented by A,

the ester mixture having the following properties:

- 1) a total acid number of 0.05 mgKOH/g or less,
- 2) a sulfated ash content of 10 ppm or less,
- 3) a sulfur content of 20 ppm or less,
- 4) a phosphorus content of 20 ppm or less,
- 5) a peroxide value of 1.0 meq/kg or less,
- 6) a carbonyl value of 10 or less,
- 7) a volume resistivity of $1 \times 10^{11} \Omega \cdot \text{cm}$ or more,
- 8) a hydroxyl value of 3 mgKOH/g or less, and
- 9) a water content of 100 ppm or less.

The paragraph beginning at page 40, line 6, has been amended as follows:

In esterification of the alicyclic dicarboxylic acid of the formula (2) as component a) in item ± 2 and in ester interchange reaction of the alicyclic dicarboxylic acid diester of the formula (3) as component a') in item ± 2 , the same alcohol component is used as component b), b') under the same reaction conditions. In the following description, therefore, the esterification and the ester interchange reaction are collectively referred to as "esterification" and the reaction conditions thereof are described.

The paragraph beginning at page 93, line 1, has been amended as follows:

While the position of double bond in cyclohexenedicarboxylic acid- anhydride may be any position relative to its acid anhydride group (-CO-O-CO-) without specific limitation, from the standpoint of hydrolysis stability, one wherein the acid anhydride group (-CO-O-CO-) is attached to the 1,2-positions and the double bond is present between 4- and 5-positions is preferable.

The paragraph beginning at page 194, line 13, has been amended as follows:

Then, to the reaction mixture was added tin oxide (0.2 wt.% based on the starting materials fed), and at 220°C, 172.8 g (± 1.2 moles) of 3,5,5-trimethylhexanol with a peroxide value of 0.1meq/kg and a carbonyl value of 0.2 as alcohol component 2 was further added dropwise. While water generated during the reaction was removed by water separator, the esterification reaction was carried out at 220°C for about 6 hours until the total acid number of the reaction mixture became 3 mgKOH/g or less, and further continued at 220°C and at 20000 Pa for 1 hour.

The paragraph beginning at page 194, line 23, and ending at page 195, line 14, has been amended as follows:

After the reaction, the excess alcohols were removed by distillation at 180°C under a reduced pressure of 1330 Pa, and the obtained liquid residue was neutralized by adding thereto 33 g of a 4% aqueous solution of sodium hydroxide and stirring the mixture at 80°C for 2 hours, and then washed with water until it became neutral, giving a crude ester mixture. At this point, the crude ester mixture had a total acid number of 0.01 mgKOH/g. Subsequently, to the crude ester mixture was added activated carbon (hirasagi M manufactured by Sumitomo Chemical Co., Ltd.; 0.1 wt.% based on the starting materials fed), and the mixture was stirred at 90°C and at 1330 Pa for 1 hour and filtered, whereby 383 g of a purified ester mixture containing (isobutyl) (3,5,5-trimethylhexyl) 4-cyclohexene-1,2-dicarboxylate was obtained. Dehydration was carried out at 100°C under a reduced pressure of 1330 Pa for 6 hours.

The paragraph beginning at page 212, line 2, has been amended as follows:

The hydrolysis stability was evaluated with respect to the ester mixtures of Examples II-1 to ~~H-18~~ II-20 and Comparative Examples II-1 and II-2. The results are shown in Table 7.

The paragraph beginning at page 212 line 7, has been amended as follows:

The heat stability was evaluated with respect to the ester mixtures of Examples II-1 to ~~H-18~~ II-20 and Comparative Examples II-1 and II-2. The results are shown in Table 7.

The paragraph beginning at page 212, line 11, has been amended as follows:

The electrical insulating property was evaluated in terms of volume resistivity with respect to the ester mixtures of Examples II-1 to H-18 II-20 and Comparative Examples II-1 and II-2. The results are shown in Table 7.

IN THE CLAIMS:

Claim 31 has been amended as follows:

31. (Amended) A refrigerator lubricating oil comprising the alicyclic or aromatic adjacent dicarboxylic acid mixed diester according to any one of claims 14 and 15 ~~or the ester mixture according to any one of claims 16-18.~~